Grade Seven

The seventh-grade standards emphasize constructing programs and utilizing algorithms to accomplish a task. Students continue to decompose larger problems into smaller tasks and recognize the impacts of computing and computing devices. Students in seventh grade explore processing data as well as its transmission over networks. The accurate use of terminology as well as the responsible use of technology will continue to be built upon. The foundational understanding of computing and the use of technology will be an integral component of successful acquisition of skills across content areas.

Algorithms and Programming

7.1 The student will construct programs to accomplish a task as a means of creative expression or scientific exploration using a block based or text based programming language, both independently and collaboratively,

a) combining control structures such as if-statements and loops including compound conditionals; and
b) creating clearly named variables that represent different data types, including numeric and non-numeric data, and perform operations on their values. [Related SOL: Math 7.1, 7.2]

7.2 The student will document programs to make them easier to follow, test, and debug.

7.3 The student will distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.

7.4 The student will decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.

Computing Systems

7.5 The student will describe how the Internet connects devices and networks all over the world. *Exclusion: Specific devices used to implement the Internet are beyond the scope of these standards.*

Cybersecurity

7.6 The student will explain how physical and digital security measures protect electronic information.

7.7 The student will identify existing cybersecurity concerns associated with Internet use and Internet-based systems and potential options to address these issues.

Data and Analysis

7.8 The student will discuss the correctness of a model representing a system by comparing the model's generated results with data that were observed in the system being modeled.

7.9 The student will refine computational models based on the data they have generated.

Impacts of Computing

7.10 The student will explain how advances in technology have contributed to Virginia's prosperity and role in the global economy. [Related SOL: VS.10]

7.11 The student will describe the development of new technologies in communication, entertainment, and business and their impact on American life. [Related SOL: USII.9]

7.12 The student will explore careers related to the Internet. [Related SOL: English 7.6]

Networking and the Internet

7.13 The student will outline the advantages and disadvantages of transmitting information over the Internet, including speed, reliability, cost and security.

7.14 The student will explain why protocols are necessary in data transmission. Model the role of protocols in transmitting data across networks and the Internet.

7.15 The student will model how information is broken down into smaller pieces, transmitted as packets through multiple devices over networks and the Internet, and reassembled at the destination.